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United States
Department of
Agriculture

**Animal and
Plant Health
Inspection
Service**

Veterinary
Services

APHIS 91-39
August 1983

National Tick Surveillance Program

Calendar Year 1982

U.S.D.A.
NATL AGRIC LIBRARY
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CURRENT SERIAL RECORDS

National Tick Surveillance Program
Calendar Year 1982

During calendar year 1982, the collection and submission of ticks from native and imported animals plus plant and animal material was 3 percent less than in 1981. There were 9,086 collections in 1982, compared to 9,381 in 1981, 7,763 in 1980, 11,553 in 1979, and 12,242 in 1978.

Heartwater Survey in the Caribbean

In 1982 there was continued concern regarding heartwater in the West Indies. Heartwater was reported from the French island of Guadeloupe in the West Indies in 1980.[1] Heartwater is a tick-borne disease of cattle, sheep, and goats caused by the rickettsial agent *Cowdria ruminantium.* The disease is transmitted by ticks of the genus Amblyomma. In Africa, where the disease originated, the principal vectors are *Amblyomma hebraeum* and *A. variegatum,* although other African ticks such as *A. pomposum* and *A. gemma* are involved in the natural transmission of heartwater.

There is a particular concern about the report of heartwater in the West Indies since one of the principal vectors, *A. variegatum*, is now established in Puerto Rico, Guadeloupe, Martinique, Antigua, and St. Kitts. There have been no reports of heartwater in Puerto Rico.

The clinical signs of heartwater may vary greatly depending on the virulence of the strain of *Cowdria ruminantium* and the susceptibility of the host. In acute heartwater there may be high fever, nervous signs, diarrhea, depression, a stiff gait, high stepping, exaggerated chewing movements and blinking of the eyes, convulsions, prostration, and death. Mortality in susceptible livestock may range from 30 to 60 percent or higher. Some wild African ruminants (blesbok, springbok, and black wildebeest) may develop inapparent infections and serve as reservoirs of *C. ruminantium.*

Footnotes

1. Perreau, P.; Morel, P. C.; Barre, N. et al: Existence de la cowdriose (heartwater) a *Cowdria ruminantium* chez les ruminants de Antilles francaises (La Guadeloupe) et des Mascareignes (La Reunion et Ile Maurice). Rev. Elev. Med. Vet. Pays Trop. 33:21-22. 1980.

2. Uilenberg, G. Experimental transmission of *Cowdria ruminantium* by the Gulf Coast tick *Amblyomma maculatum:* Danger of introducing heartwater and benign African theileriasis onto the American mainland. Am. J. Vet. Res. Vol. 43 (7):1279-1282. 1982

Recent studies have also shown that at least one North American *Amblyomma* species, *A. maculatum*, is an experimental vector of *C. ruminantium.*[2] This is an alarming finding since *A. maculatum* is established in all or part of at least 10 States on the U.S. mainland. *A. maculatum* is commonly found from the coastal area of Texas, up into northeastern Oklahoma and southeastern Kansas, and eastward from Texas through the Gulf Coast States into Florida, Georgia, and South Carolina.

In 1982 the U.S. Department of Agriculture sent a team of foreign animal specialists to conduct a survey of six islands in the West Indies. Although evidence of heartwater was not found on Antigua, Dominica, St. Kitts, St. Lucia, Nevis, or St. Vincent, one of the vectors of heartwater, *A. variegatum*, was found on four of the islands.

Additional surveillance studies are planned for 1983. A grant from the U.S. Department of Agriculture to the University of Florida will support further studies in the West Indies. The University of Florida research team will cooperate with the French veterinarians at the Instit National de las Recherche Agronomique at Gardel, Grande Terre, Guadeloupe. They will study the virulence of the West Indian strain of heartwater, the distribution of the disease, and how to prevent the spread of heartwater and *A. variegatum.*

***Amblyomma variegatum* Eradication in Puerto Rico**

Since May 1981, all known *Amblyomma variegatum* premises have been placed under quarantine and systematic treatment. Municipalities known to have infested herds in 1982 include: Cabo Rojo in the southwest; Ponce in the south central; and Cidra, Aibonito, Aguas Buenas, Comerio, Cayey, and Naranjito in the east central part of the island. Also, in 1982, infestations continued to be reported on Vieques, an island off the east coast of Puerto Rico. The National Veterinary Services Laboratories, Pathobiology Laboratory, Ames Iowa, confirmed 50 collections of *A. variegatum* in calendar year 1982 as compared to 87 confirmed collections in calendar year 1981.

***Boophilus microplus* Eradication in Puerto Rico**

The *Boophilus* tick eradication program continued to make progress on two fronts, one in the northwest and the other in the southeast regions of the main lands of Puerto Rico. The northwestern area includes the municipalities of Aguadialla, Moca, Isabela, San Sebastian, and Quebradiallas. The southeastern area includes the municipalities of Guardo, Juncos, San

Lorenzo, Las Piedras, Naguabo, Humacao, and Yubucoa. At the end of 1982 approximately 2,4000 herds, involving over 72,000 animals, free of ticks in the two quarantine and systematic tick treatment areas.

Important strides in the tick eradication program in 1982 include the development of an effective and close working relationship with commonwealth officials, the appropriate legal structure and action procedures, policies to ensure employee safety while working with pesticides, procedures for handling livestock pesticide toxicosis problems, a Tick Advisory Committee, availability of alternate pesticides, the use of cage vats as an alternative to spraying livestock, and tick and pesticide research projects in Puerto Rico.

Progress Report on the New Cattle Fever Tick Research Laboratory

By the end of fiscal year 1983, the Agricultural Research Service (ARS) will move the Cattle Fever Tick Research Laboratory from Falcon Heights, Texas, to a new $700,000 facility at Mission, Texas. The new laboratory is located on a 100-acre plot on the northwest corner of the old Moore Air Base near the sterile screwworm fly production plant. The new site will feature the following: (1) separate laboratories for research on tick biology and acaricides, (2) covered animal holding facilities for 64 tick-infested cattle, (3) a modern dipping vat and spraying facilities for acaricide testing, (4) a dipping vat and holding pens exclusively for treating cattle to move them outside the quarantined premises of the laboratory, and (5) about 90 acres of pasture for use as experimental plots. The experimental pastures will permit research on a variety of problems including the role of white-tail deer and exotic game animals in the ecology of *Boophilus* ticks, and the sterile hybrid *Boophilus* eradication method.

Recent Tick Research at the Falcon Heights Laboratory

During the past year samples of both *Boophilus microplus* and *B. annulatus* collected from tick-infested cattle detected in the Tick Eradication Buffer Zone were colonized and bioassayed to determine if acaricide resistant ticks were being introduced from Mexico. As in the past, all of the ticks in the samples tested were completely susceptible. In the event that coumaphos-resistant ticks are detected, knowledge of the efficacies of compounds that are alternatives to coumaphos or other organophosphates will be important in selecting other acaricides for use in the eradication program. None of the nonorganophosphate acaricides tested to date provide 100 percent control of either cattle tick species. However, amitraz, a diamidide applied as a spray at 0.015 percent active ingredient, provided greater than 98 percent controls of the larvae, nymphs, and adults on the cattle at the time of treatment and provided 100 percent residual protection for 7 days, post treatment against reinfestation by larvae. Unfortunately, a formulation of amitraz suitable for use in dipping vats has not been developed for use in the United States.

Tick Research in Puerto Rico

The ARS Tropical Tick Research Laboratory in Mayaguez, Puerto Rico, continues to provide research support to the tick eradication efforts in Puerto Rico. Because of the risk of crotoxyphos (Cio-Rid®) toxicosis both in personnel of the tick eradication force and treated livestock, a safer but efficacious acaricide is needed. Extensive field tests demonstrated that both amitraz and permethrin can be effective replacements for crotoxyphos. Unfortunately, when applied as sprays neither of these compounds controls 100 percent of the ticks on cattle and, therefore, should not be used on the tick quarantine line.

All the potential hosts in Puerto Rico of the tropical bont tick were surveyed for 2 years near Cidra, Puerto Rico, in the heart of the area where the tick occurs. All stages of the tropical bont tick have been collected from goats, horses, and cattle, but not from other domestic animals or wildlife. The limited host-range in Puerto Rico of this tick will greatly simplify efforts to eradicate it.

Boophilus Program in Texas

In 1982 Veterinary Services Tick Eradication personnel apprehended 81 head of Mexican livestock along the Texas-Mexico border areas from Brownsville to the Amistad Dam near Del Rio. This compared to 76 apprehensions in fiscal year 1981. Thirty-four of the 1982 apprehensions were cattle, of which 14 were infested with *Boophilus* ticks. Forty-seven apprehensions were horses, of which none was tick infested. Thirty-four Texas premises were placed under quarantine as the result of exposure to infested Mexican livestock. Five new *Boophilus* infested premises were found in the Free Area and 15 in the Buffer Area during fiscal year 1982.

In October 1982, Congress passed Public Law 97-312 which provides that tick inspectors who have been designated by the Secretary of Agriculture and the U.S. Attorney General can carry firearms for self-protection. Inspectors authorized to carry firearms must first receive firearms training at the Federal Law Enforcement Center, Glynco, Georgia. The first class of 24 tick inspectors is tentatively scheduled to begin training in December 1983.

New Formulation of Coumaphos

For many years arsenicals were used as the acaricide in official U.S. tick Eradication Program work. Because of environmental hazards of arsenic residues in the formulation used to dip cattle, use of arsenical solutions was discontinued in 1973.

Coumpahos, formulated as CoRal® Animal Insecticide 25% Wettable Powder, was selected in 1969 for use in official Tick Eradication Programs. Coumaphos has proven to be a very effective acaricide. The wettable powder formulation does have an undesirable characteristic; i.e., very rapid settline out of suspension. This settling out characteristic makes dipping vat management difficult.

Bayvet Corporation is now marketing a flowable formulation of coumaphos, CoRal® Flowable Cattle Insecticide. The flowable formulation is equally effective against ticks and virtually eliminates the problems of settling out of the suspension. Unfortunately, the current registered label for flowable coumaphos does not list horses as an animal that may be treated.

The Tick Force currently has three vats charged with the flowable formulation of coumaphos. Samples are taken from the vats each time animals are dipped, and, to date, all samples have been within the recommended pesticide concentration. As the supply on hand of wettable powder is depleted, additional vats will be charged with the flowable coumaphos.

Use of the flowable formulation of coumaphos should result in more efficient vat management and ensure that all animals are treated with the recommended concentration of pesticide.

Suggestions to Protect Livestock from *Boophilus* Ticks

According to Dr. John Gray, Tick Epidemiologist, South Central Region, prevention of tick infestation starts with the livestock owner. No State or Federal agency can provide the day-to-day protective measures that the owner can provide.

Prevention starts with good fences that keep the livestock on clean, non-infested land and protect the ranch from becoming exposed to tick-infested stray livestock.

Domestic livestock, principally cattle, are usually responsible for spreading ticks. Know the movements of livestock within the ranch and maintain records of movements. In the event that part of the ranch becomes tick infested, the infestation can be defined and eradicated rapidly.

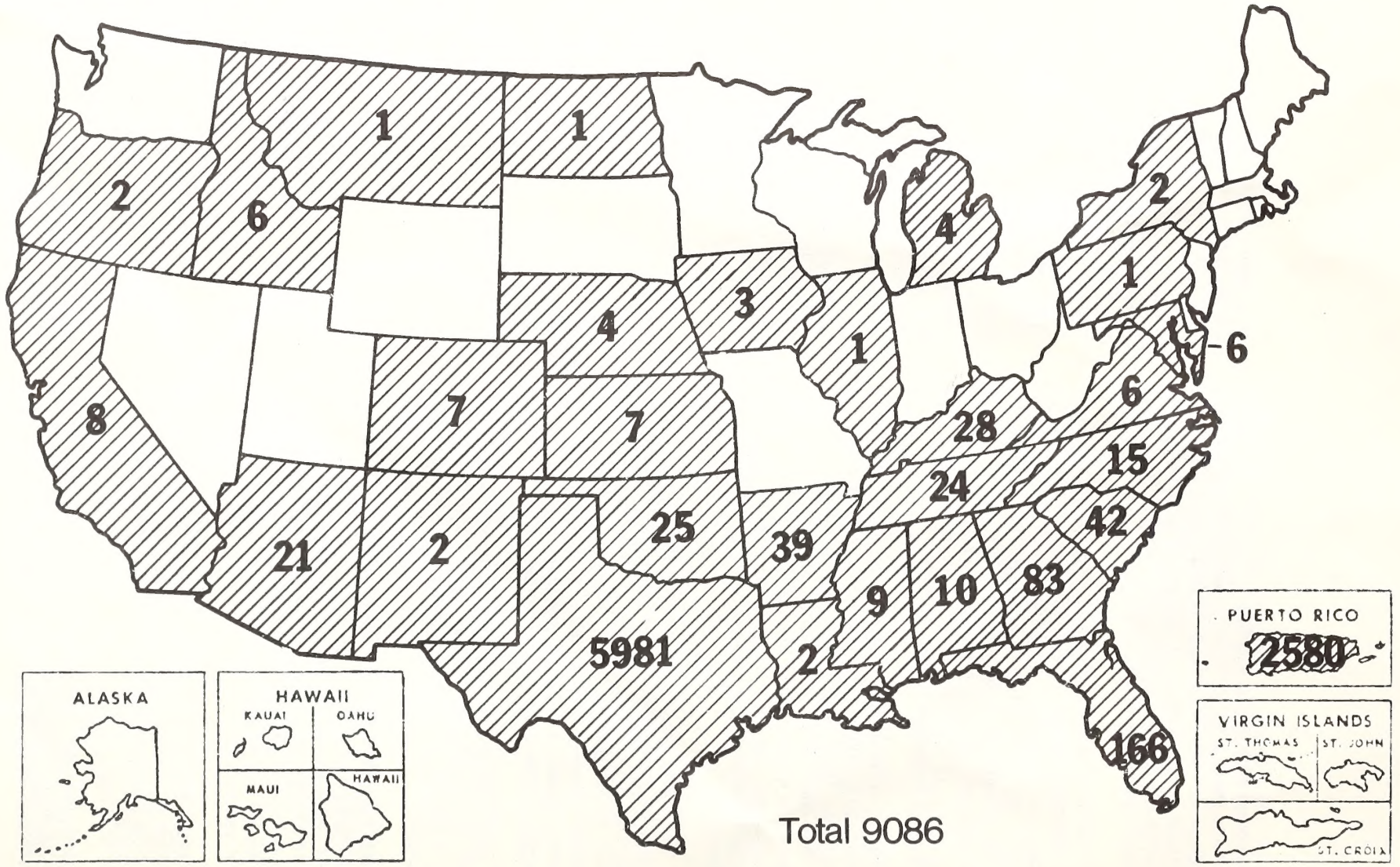
If one or more pastures are at high risk to ticks, always have the livestock from such pastures inspected and dipped by tick program personnel before moving these livestock to other pastures.

When purchasing new animals—be safe. Have the new animals inspected and dipped before bringing them onto the ranch.

Horses at risk to ticks should be on 14-day treatment to prevent the introduction of ticks. Ask the tick program personnel if your horses should be on a "14-day pass."

Livestock owners ranching in high-risk areas of tick infestation should always be alert to the possibility of tick infestation. They should take special precautions to prevent the introduction and spread of ticks.

Tick Collections From All Hosts
CY 1982



REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1982

HOST: All Hosts

STATE	TOTAL	CATTLE	DOGS	HORSES & MULES	ZOO ANIMALS & MISC. HOSTS	NATIVE WILDLIFE	ANIMALS & PRODUCTS FOR ENTRY
TOTAL	9086	7118	391	882	139	461	96
Alabama	10	3	1			6	
Alaska							
Arizona	21	1					20
Arkansas	39	4			1	34	
California	8	1	2		1		4
Colorado	7		5	1	1		
Connecticut							
Delaware							
Florida	166	81	39	22	15	8	1
Georgia	83	13				70	
Hawaii							
Idaho	6	5	1				
Illinois	1						1
Indiana							
Iowa	3		2		1		
Kansas	7	7					
Kentucky	28	3	7	2	2	14	
Louisiana	2					1	1
Maine							
Maryland	6					6	
Massachusetts							
Michigan	4		1			3	
Minnesota							
Mississippi	9	6			3		
Missouri							
Montana	1				1		
Nebraska	4	2	2				
Nevada							
New Hampshire							
New Jersey							
New Mexico	2						2
New York	2						2
North Carolina	15	1	6		5	3	
North Dakota	1				1		
Ohio							
Oklahoma	25	15			3	7	
Oregon	2	1		1			
Pennsylvania	1						1
Rhode Island							
South Carolina	42	11	6		2	23	
South Dakota							
Tennessee	24	21	2		1		
Texas	5981	4533	314	724	61	285	64
Utah							
Vermont							
Virginia	6	1	3		2		
Washington							
West Virginia							
Wisconsin							
Wyoming							
Puerto Rico	2580	2409		132	39		
Virgin Islands							

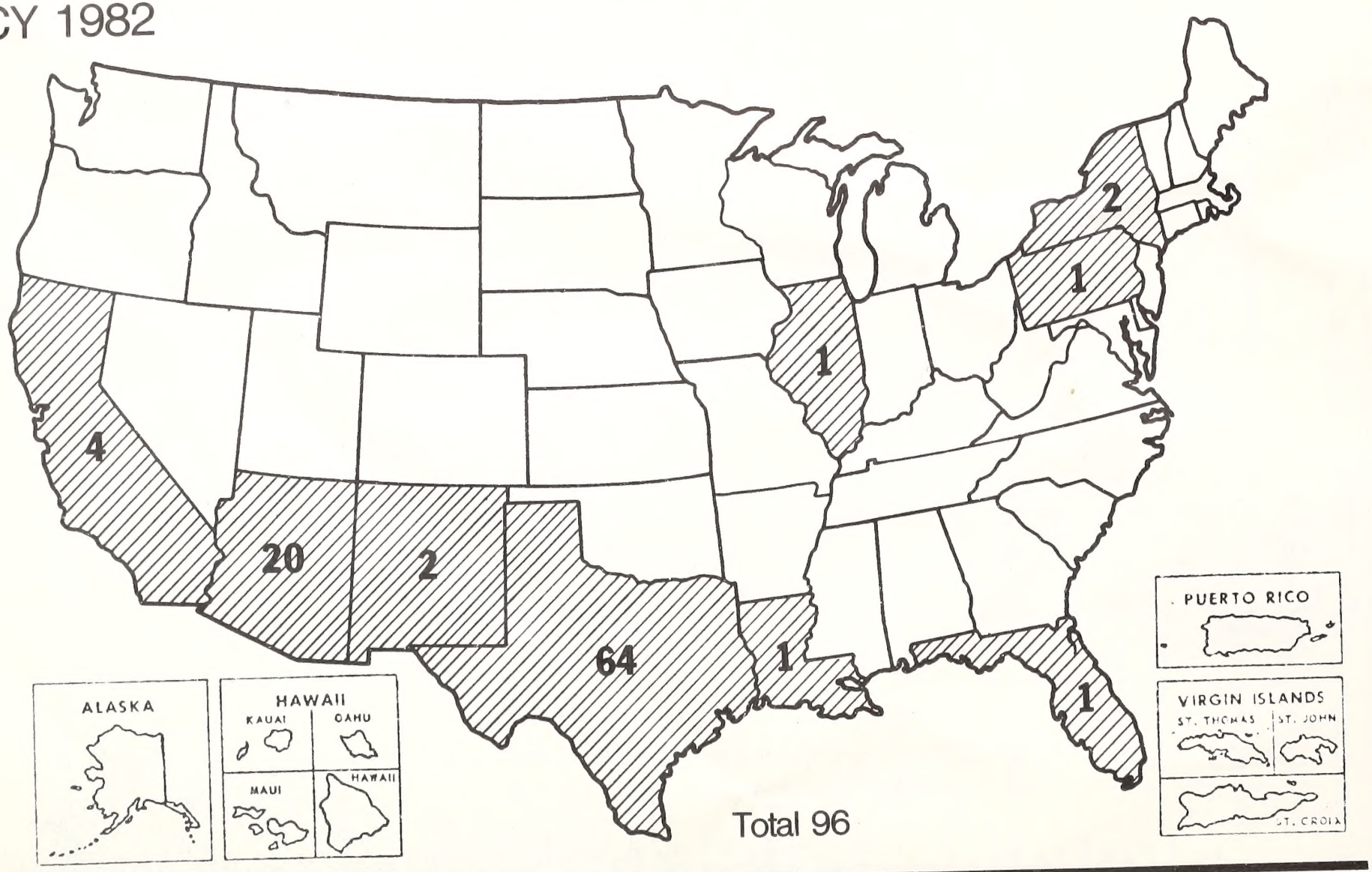
AMN FORM 5-55 MAY 1971

REPLACES ADE FORM 5-65, DEC 1964, WHICH IS OBSOLETE

USDA-ARS

Tick Collections From Animals And Products Offered For Entry

CY 1982



REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1982

HOST: Animals and Products for Entry

STATE	TOTAL	AMBLYOMMA AMERICANUM	AMBLYOMMA CAJENNENSE	AMBLYOMMA IMITATOR	AMBLYOMMA MACULATUM	AMBLYOMMA SPP.	ARGAS PERSICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR ANDERSONI STILES (= D. VARIABILIS)	DERMACENTOR NITENS	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIABILIS	DERMACENTOR SPP.	HAEMAPHYSALIS LEPORISPALUSTRIS	IXODES COOKEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBIUS MEGNINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	MISCELLANEOUS SPP.
TOTAL	96	1						20	6	10	23				1	2	16							12	4		1
ARIZONA																											
Douglas	11										11BO																
Tucson	9																9BH[d]										
CALIFORNIA																											
Los Angeles	1																										1HO[aa]
San Ysidro	3														1D									2HO			
FLORIDA																											
Miami Airport	1																								1OR		
ILLINOIS																											
Chicago Airport	1																1AH[dn]										
LOUISIANA																											
New Orleans	1																								1CR		
NEW MEXICO																											
Dona Ana	2										1BO													1BO			
NEW YORK																											
JFK	1																								1BG		
Seaport	1																								1F		
PENNSYLVANIA																											
Philadelphia Airport	1															1BG											
TEXAS																											
Del Rio	16							5BO	2BO	5BO**	4BO																
Eagle Pass	26	1BO						14BO		5BO**	4BO						1BO**							1BO			
El Paso	14										2BO						5BO[a]							7BO			
Houston	2															1GD								1HG			
Larado	5							1BO	4BO																		
Presidio	1										1BO																

AMH Form 5-55 MAY 1971 — REPLACES ADE FORM 5-45, DEC 1964, WHICH IS OBSOLETE — USDA-ARS

Key to Host

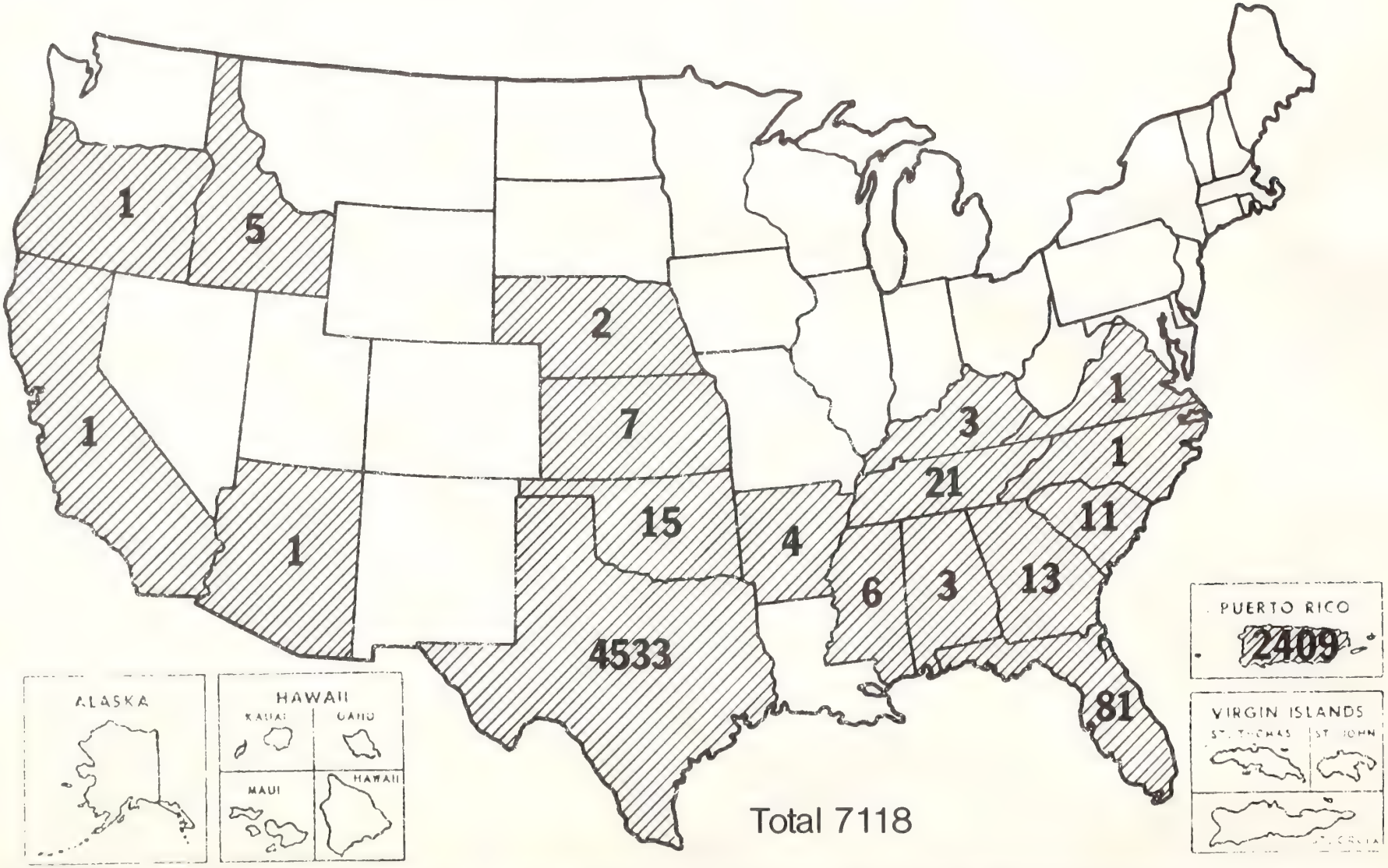
AH Animal Hides	F Foodstuffs
BG Baggage	GD Ground
BH Bighorn Sheep	HG Household Goods
BO Bovine	HO Horse
CR Crate	OR Orchid
D Deer	

Key to Species

a Dermacentor parumapertus
aa Haemaphysalis longicornis (= H. bispinosa)
d Dermacentor hunteri
dn Dermacentor nuttalli

** Nymphal Stage

Tick Collections From Cattle
CY 1982



REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1982

HOST: Cattle

STATE	TOTAL	AMBLYOMMA AMERICANUM	AMBLYOMMA CAYENNENSE	AMBLYOMMA IMITATOR	AMBLYOMMA MACULATUM	AMBLYOMMA SPP.	ARGAS PERSICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR VARIABILIS & ANDERSONI	DERMACENTOR NIGROLINEATUS	DERMACENTOR NITENS	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIABILIS	DERMACENTOR SPP.	HAEMAPHYSALIS LEPORIS PALUSTRIS	IXODES COOKEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBIUS MEGNINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	MISCELLANEOUS SPP.
TOTAL	7118	647	437	10	1975	44		18	2201	2	189		35	202		1171	20	2			29			123	13		
Alabama	3	1			2																						
Alaska																											
Arizona	1										1																
Arkansas	4	3														1											
California	1																							1			
Colorado																											
Connecticut																											
Delaware																											
Florida	81	20			38											12					9				2		
Georgia	13	4			1											7					1						
Hawaii																											
Idaho	5										3													2			
Illinois																											
Indiana																											
Iowa																											
Kansas	7				1											6											
Kentucky	3															3											
Louisiana																											
Maine																											
Maryland																											
Massachusetts																											
Michigan																											
Minnesota																											
Mississippi	6	2			4																						
Missouri																											
Montana																											
Nebraska	2				1											1											
Nevada																											
New Hampshire																											
New Jersey																											
New Mexico																											
New York																											
North Carolina	1															1											
North Dakota																											
Ohio																											
Oklahoma	15	5			2																4			4			
Oregon	1										1																
Pennsylvania																											
Rhode Island																											
South Carolina	11	3			2											6											
South Dakota																											
Tennessee	21	9														11					1						
Texas	4533	599	437	10	1779	55** 90n		18	39	2**	184		35			1123	20**	2			14			116	10		
Utah																											
Vermont																											
Virginia	1	1																									
Washington																											
West Virginia																											
Wisconsin																											
Wyoming																											
Puerto Rico	2409					44v			2162					202											1		
Virgin Islands																											

AMN FORM S-35 MAY 1971 — REPLACES ADE FORM S-35, DEC 1964, WHICH IS OBSOLETE — USDA-ARS

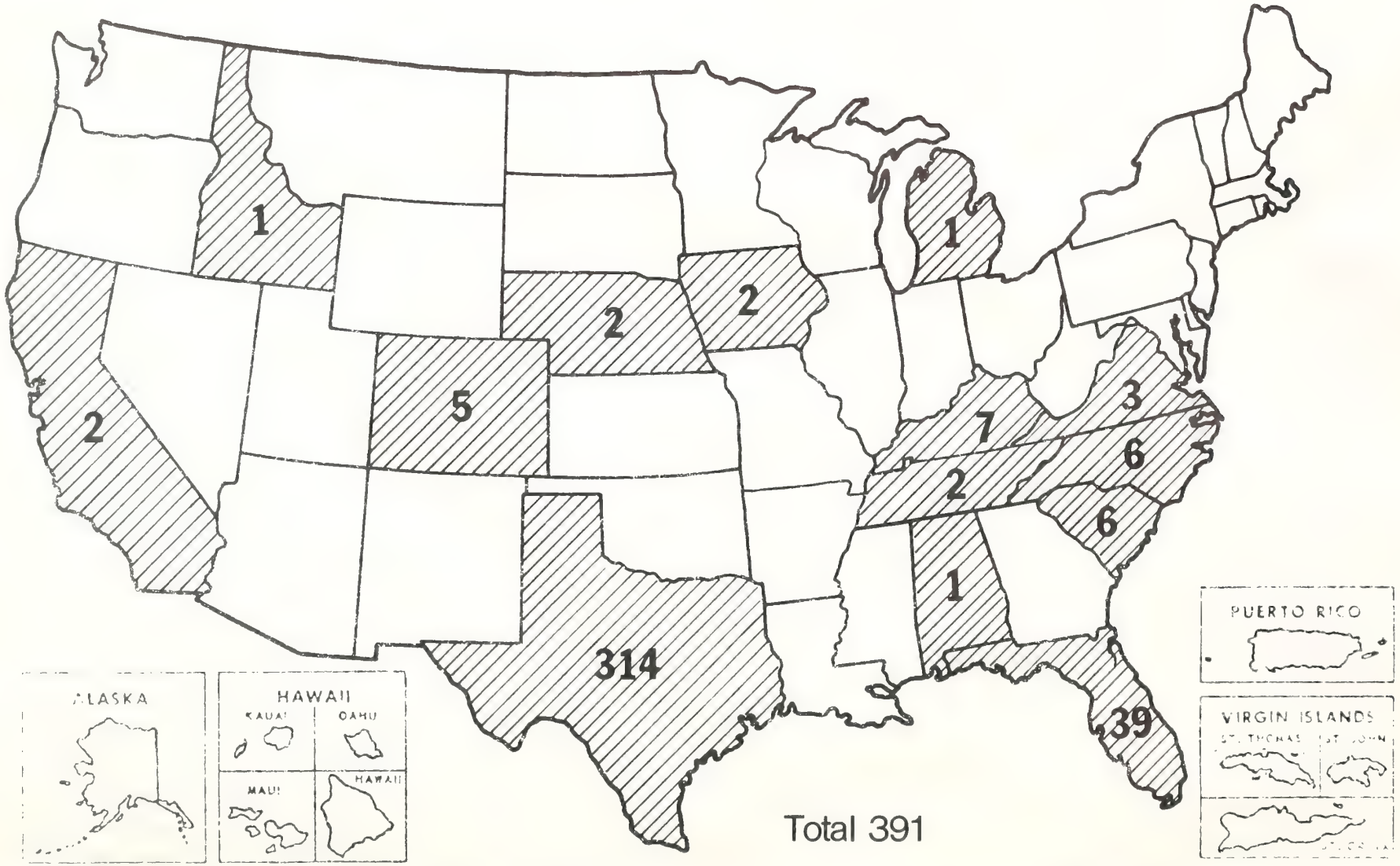
Key to Species

v Amblyomma variegatum

n Amblyomma inornatum

** Nymphal Stage

Tick Collections From Dogs
CY 1982



REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1982 | HOST: Dogs

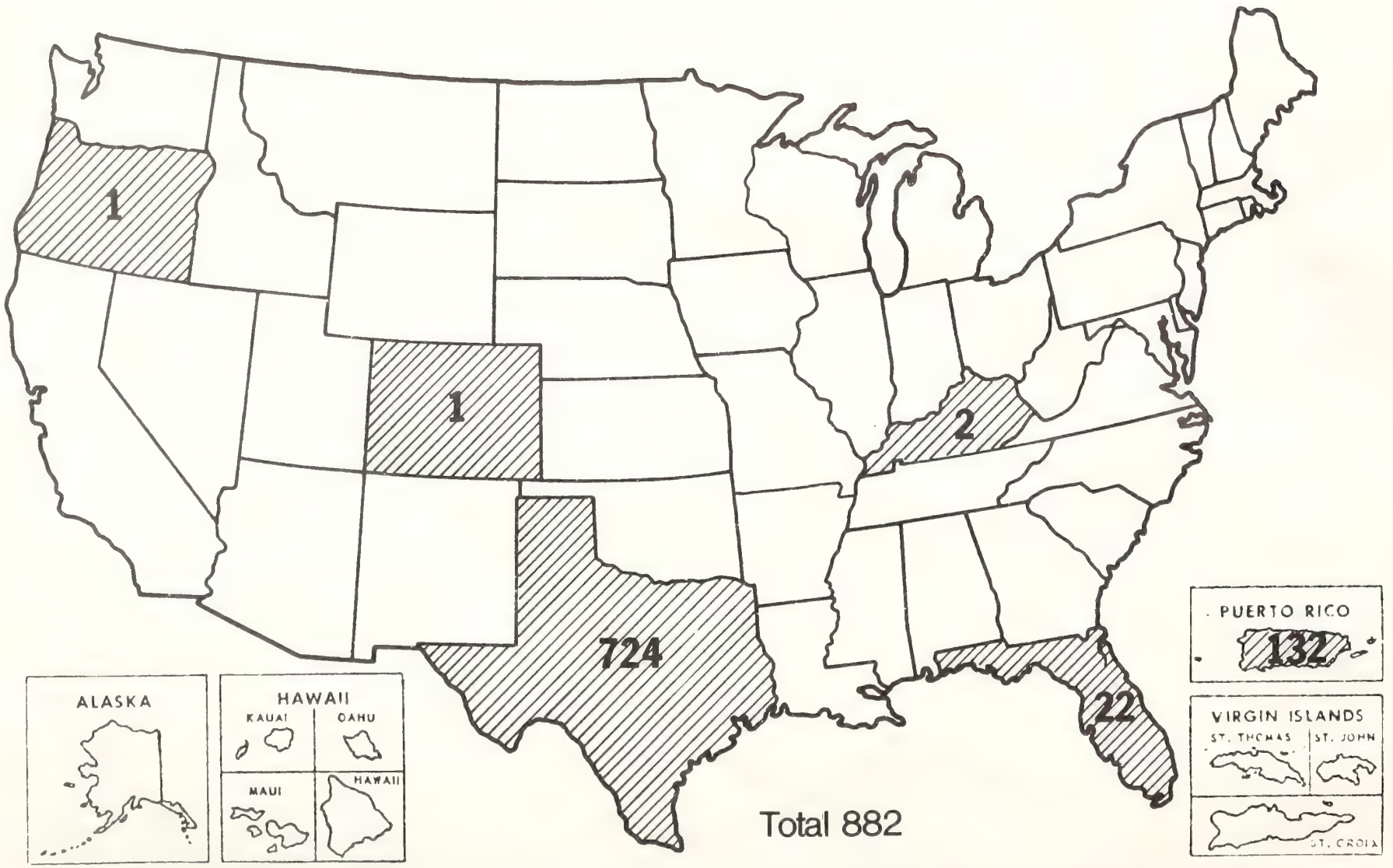
STATE	TOTAL	AMBLYOMMA AMERICANUM	AMBLYOMMA CAYENNENSE	AMBLYOMMA IMITATOR	AMBLYOMMA MACULATUM	AMBLYOMMA SPP.	ARGAS PERICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR ATRICAPILLUS (=PICTUS) VARIABILIS & PARKSI	DERMACENTOR NIGROLINEATUS	DERMACENTOR NITENS	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIABILIS	DERMACENTOR SPP.	HAEMAPHYSALIS LEPORIS-PALUSTRIS	IXODES COOKEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBIUS MEGNINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	MISCELLANEOUS SPP.
TOTAL	391	5			14	6					1					210			3		10	2			140		
Alabama	1																								1		
Alaska																											
Arizona																											
Arkansas																											
California	2									a															2		
Colorado	5										1											1[k]			3		
Connecticut																											
Delaware																											
Florida	39	1			2											18			1		5				12		
Georgia																											
Hawaii																											
Idaho	1																								1		
Illinois																											
Indiana																											
Iowa	2															1						1*					
Kansas																											
Kentucky	7															5			1						1		
Louisiana																											
Maine																											
Maryland																											
Massachusetts																											
Michigan	1																					1[a]					
Minnesota																											
Mississippi																											
Missouri																											
Montana																											
Nebraska	2															2											
Nevada																											
New Hampshire																											
New Jersey																											
New Mexico																											
New York																											
North Carolina	6	2														2			1						1		
North Dakota																											
Ohio																											
Oklahoma																											
Oregon																											
Pennsylvania																											
Rhode Island																											
South Carolina	6	1														3					1				1		
South Dakota																											
Tennessee	2															2											
Texas	314	1			12	6[n]										174					3				118		
Utah																											
Vermont																											
Virginia	3															3											
Washington																											
West Virginia																											
Wisconsin																											
Wyoming																											
Puerto Rico																											
Virgin Islands																											

AMH FORM S-55 MAY 1971 — REPLACES ADE FORM S-55, DEC 1964, WHICH IS OBSOLETE — USDA-ARS

Key to Species
a Ixodes dammini
k Ixodes kingi
n Amblyomma inornatum

* Dog spent 1 week in Wisconsin prior to collection.

Tick Collections From Horses And Mules
CY 1982



REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1982 | HOST: Horses and Mules

STATE	TOTAL	AMBLYOMMA AMERICANUM	AMBLYOMMA CAJENNENSE	AMBLYOMMA IMITATOR	AMBLYOMMA MACULATUM	AMBLYOMMA SPP.	ARGAS PERSICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR NITENS	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIABILIS	DERMACENTOR SPP.	HAEMAPHYSALIS LEPORISPALUSTRIS	IXODES COOKEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBIUS MEGNINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	MISCELLANEOUS SPP.
TOTAL	882	18	41	8	54	6			20	30		27	125	561	4	1			3			1	2		
Alabama																									
Alaska																									
Arizona																									
Arkansas																									
California																									
Colorado	1																					1			
Connecticut																									
Delaware																									
Florida	22				6							12		1					2				1		
Georgia																									
Hawaii																									
Idaho																									
Illinois																									
Indiana																									
Iowa																									
Kansas																									
Kentucky	2													2											
Louisiana																									
Maine																									
Maryland																									
Massachusetts																									
Michigan																									
Minnesota																									
Mississippi																									
Missouri																									
Montana																									
Nebraska																									
Nevada																									
New Hampshire																									
New Jersey																									
New Mexico																									
New York																									
North Carolina																									
North Dakota																									
Ohio																									
Oklahoma																									
Oregon	1									1															
Pennsylvania																									
Rhode Island																									
South Carolina																									
South Dakota																									
Tennessee																									
Texas	724	18	41	8	48	2**			1	29		8	4	558	4**	1			1				1		
Utah																									
Vermont																									
Virginia																									
Washington																									
West Virginia																									
Wisconsin																									
Wyoming																									
Puerto Rico	132					4[v]			19				109												
Virgin Islands																									

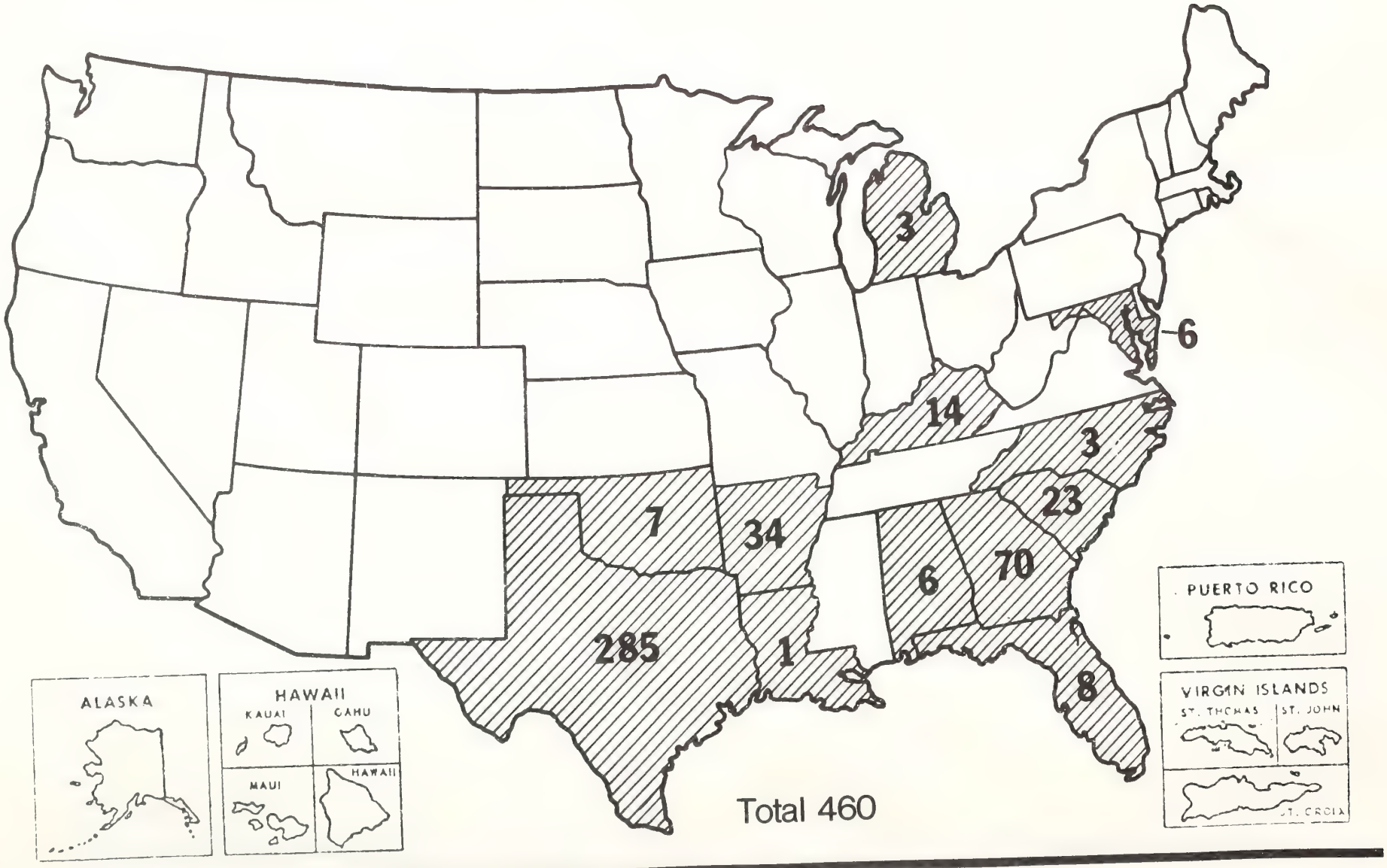
ANH FORM 5-55 MAY 1971 — REPLACES ADE FORM 5-55, DEC 1964, WHICH IS OBSOLETE — USDA-ARS

Key to Species

v Amblyomma variegatum

**Nymphal Stage

Tick Collections From Native Wildlife
CY 1982



REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1982 | HOST: Native Wildlife

STATE	TOTAL	AMBLYOMMA AMERICANUM	AMBLYOMMA CAJENNENSE	AMBLYOMMA IMITATOR	AMBLYOMMA MACULATUM	AMBLYOMMA SPP.	ARGAS PERSICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR SILVARUM	DERMACENTOR VENUSTUS & D. ANDERSONI	DERMACENTOR NITENS	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIABILIS	DERMACENTOR SPP.	HAEMAPHYSALIS LEPORIS-PALUSTRIS	IXODES COOKEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBIUS MEGNINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	MISCELLANEOUS SPP.
TOTAL	460	113	5		17	18					89		19		47	9	101	6		23	11			2		
Alabama	6	5D			1D																						
Alaska																											
Arizona																											
Arkansas	34	32D																		2BC							
California																											
Colorado																											
Connecticut																											
Delaware																											
Florida	8	6D													1RC					1D							
Georgia	70	15FY 33D 1RC			3D										4RC 1FY		1TO**	3RC		1FY 4D	1BI[b]						
Hawaii																					1D[a] 1TO[b] 1RC[t]						
Idaho																											
Illinois																											
Indiana																											
Iowa																											
Kansas																											
Kentucky	14	3RC 1GF													5RC			2RC 1GF			2RC[t]						
Louisiana	1				1D																						
Maine																											
Maryland	6	5D													1BB												
Massachusetts																											
Michigan	3																				3RC[t]						
Minnesota																											
Mississippi																											
Missouri																											
Montana																											
Nebraska																											
Nevada																											
New Hampshire																											
New Jersey																											
New Mexico																											
New York																											
North Carolina	3												1D								1D	1RC[t]					
North Dakota																											
Ohio																											
Oklahoma	7										1D									4BC 1D,1GF							
Oregon																											
Pennsylvania																											
Rhode Island																											
South Carolina	23	5D 1BD*			1D								7D		1BD*					7D	1B[b]						
South Dakota																											
Tennessee																											
Texas	285	2RC 1BC,3D	3D,2J		11D	2D[n] 3R[n] 13D					88D		11D		8BC 2D 1RC 14CO 8J 1GF	9D**	1D** 99R			1D				1D 1R			
Utah																											
Vermont																											
Virginia																											
Washington																											
West Virginia																											
Wisconsin																											
Wyoming																											
Puerto Rico																											
Virgin Islands																											

ANH FORM 5-55 MAY 1971 — REPLACES ADE FORM 5-55, DEC 1964, WHICH IS OBSOLETE — USDA-ARS

Key to Host

B	Bird	FY	Feral Swine
BB	Black bear	GF	Grey Fox
BC	Bobcat	J	Javelina (peccary)
BD	Badger	R	Rabbit
BI	Bluebird	RC	Raccoon
CO	Coyote	TO	Towhee
D	Deer		

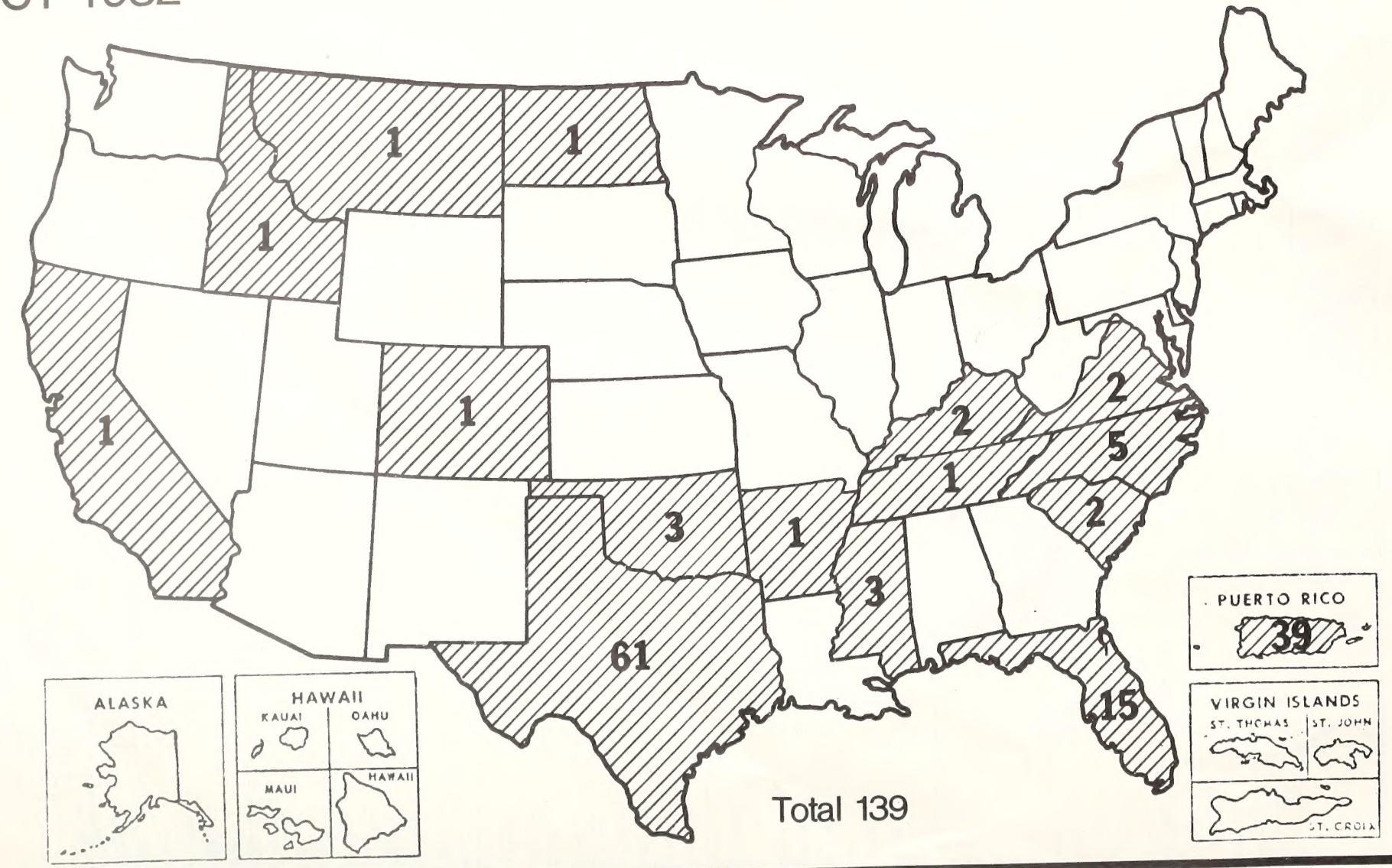
Key to Species

a	Ixodes affinis
b	Ixodes brunneus
n	Amblyomma inornatum
t	Ixodes texanus

*Origin Kansas
**Nymphal Stage
Bracketed figures refer to state indicated

Tick Collections From Zoo Animals And Miscellaneous Hosts

CY 1982



REPORT OF TICKS COLLECTED

PERIOD: Calendar Year 1982

HOST: Zoo Animals and Miscellaneous Hosts

STATE	TOTAL	AMBLYOMMA AMERICANUM	AMBLYOMMA CAJENNENSE	AMBLYOMMA IMITATOR	AMBLYOMMA MACULATUM	AMBLYOMMA SPP.	ARGAS PERSICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR SILVARUM, D. VENUSTUS & RANKSI	DERMACENTOR NITENS	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIABILIS	DERMACENTOR SPP.	HAEMAPHYSALIS LEPORIS-PALUSTRIS	IXODES COOKEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBIUS MEGNINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	MISCELLANEOUS SPP.
TOTAL	139	18	7	2	15	8			27			3		8		35					6		1	4	5		
Alabama																											
Alaska																											
Arizona																											
Arkansas	1																							1Q			
California	1	1G*																									
Colorado	1											1H															
Connecticut																											
Delaware																											
Florida	15	3H 1HM 1G,1Y			1H	1ZO[ar]										1HM					3C 1HM 1Y				1HS		
Georgia																											
Hawaii																											
Idaho	1											1H															
Illinois																											
Indiana																											
Iowa																											
Kansas																											
Kentucky	2															2H											
Louisiana																											
Maine																											
Maryland																											
Massachusetts																											
Michigan																											
Minnesota																											
Mississippi	3	1X			1X																			1Q			
Missouri																											
Montana	1											1S															
Nebraska																											
Nevada																											
New Hampshire																											
New Jersey																											
New Mexico																											
New York																											
North Carolina	5	2H														3H											
North Dakota	1															1HM											
Ohio																											
Oklahoma	3	1Y														1Y					1C						
Oregon																											
Pennsylvania																											
Rhode Island																											
South Carolina	2															2Y											
South Dakota																											
Tennessee	1															1X											
Texas	61	5H 2G	2H 3Y	2H	9G,1Y 2Q	1X** 2CL**										1S,9H 1C,1G							1C[ta]	1X,1Q	1CL 2C 1X		
Utah			1X 1Q		1CL											6Y,2X 1Q,1CL											
Vermont																											
Virginia	2															2H											
Washington																											
West Virginia																											
Wisconsin																											
Wyoming																											
Puerto Rico	39					2S[v] 2G[v]			16G 11S					1S,5G 2Q													
Virgin Islands																											

AMM FORM 5-55 MAY 1971 — REPLACES ADE FORM 5-65, DEC 1964, WHICH IS OBSOLETE — USDA-ARS

Key to Host

C	Cat	Q	Host not given
CL	Clothing	S	Sheep
G	Goat	X	Inanimate object
H	Human	Y	Swine
HM	Dwelling	ZO	Zoo Office
HS	Horse Stall		

Key to Species

ta	Ornithodoros talaje
v	Amblyomma variegatum
ar	Amblyomma rotundatum

*Animal from an Eastern State

**Nymphal Stage

Bracketed figures refer to state indicated

Revised August 1983